

AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently amended) A method of forming polypropylene, comprising:
providing a conduit having a catalyst inlet, a first propylene stream inlet and a second propylene stream inlet located downstream of the first propylene stream inlet, the conduit being operably connected to a polymerization vessel;
introducing a catalyst to the conduit through the catalyst inlet;
combining a first propylene stream with the catalyst to provide a mixed catalyst stream;
passing the mixed catalyst stream through the conduit to the polymerization vessel;
introducing a second propylene stream to the conduit through the second propylene stream inlet;
stopping the flow of the catalyst passing through the conduit;
removing a first section of the conduit; and
replacing the first section of the conduit with a second conduit section, wherein the removing and replacing steps are conducted while polymerization occurs in the polymerization vessel.
2. (Currently amended) A method of forming polypropylene, comprising:
providing a conduit having at least one catalyst valve, a first propylene stream inlet and a second propylene stream inlet, the conduit being operably connected to a polymerization vessel;
introducing a catalyst to the conduit;
passing the catalyst through the conduit to the polymerization vessel;
introducing a first propylene stream comprising propylene monomers to the conduit through a first propylene conduit having a first propylene valve to provide a mixed catalyst stream;
closing the catalyst valve and the first propylene valve;
introducing a second propylene stream to the conduit through a second propylene conduit having a second propylene valve;
passing the second propylene stream through the conduit to the polymerization vessel;
removing at least a first section of the conduit; and
replacing the first section of the conduit with a second conduit section, wherein the removing and replacing steps are conducted while polymerization occurs in the polymerization vessel.

3. (Original) The method of claim 2, further comprising:
opening the catalyst valve and the first propylene valve; and
closing the second propylene valve.
4. (Original) The method of claim 2, wherein the catalyst comprises a metallocene catalyst.
5. (Original) The method of claim 4, further comprising
combining an oil with the metallocene catalyst prior to introducing the metallocene catalyst to the
polymerization vessel to transport the metallocene catalyst through the conduit.
6. (Original) The method of claim 4, further comprising
combining an oil having a kinematic viscosity of between 0.63 centistokes and 200 centistokes at
40 °C with the metallocene catalyst prior to introducing the metallocene catalyst to the
polymerization vessel to transport the metallocene catalyst through the conduit.
7. (Original) The method of claim 4, wherein the metallocene catalyst has an activity of 3500
gPP/(gcat*hr) or more.
8. (Original) The method of claim 4, wherein the metallocene catalyst is a supported catalyst.
9. (Original) The method of claim 4, wherein the metallocene catalyst comprises active
metallocene in an amount of 1.5 wt% or less and metal alkyl scavenger in an amount of 12 wt %
or less.
10. (Original) The method of claim 2, wherein the at least one catalyst valve includes a first
catalyst valve and a second catalyst valve, the first catalyst valve disposed upstream of the first
propylene stream inlet.
11. (Original) The method of claim 2, wherein the first propylene stream has a velocity
sufficient to prevent plugging of the conduit during polymerization processes.

12. (Original) The method of claim 2, wherein the at least one catalyst valve includes a first catalyst valve and a second catalyst valve, the first catalyst valve disposed upstream of the first propylene stream inlet and the second catalyst valve disposed between the first propylene stream inlet and the second propylene stream inlet.
13. (Previously amended) The method of claim 2, wherein the at least one catalyst valve includes a first catalyst valve and a second catalyst valve, the first catalyst valve disposed upstream of the first propylene stream inlet and the second catalyst valve disposed between the first propylene stream inlet and the second propylene stream inlet, and wherein the first section is the portion between the first catalyst valve and the second catalyst valve.
14. (Original) The method of claim 2, wherein the at least one catalyst valve includes a first catalyst valve and a second catalyst valve, the first catalyst valve disposed upstream of the first propylene stream inlet and the second catalyst valve disposed between the first propylene stream inlet and the second propylene stream inlet, the second catalyst valve being a tight sealing high-pressure valve.
15. (Original) The method of claim 2, further comprising monitoring the conduit to identify plugging.
16. (Original) The method of claim 2, further comprising monitoring the conduit to identify plugging and wherein the removing at least a section of the conduit occurs upon at least partial plugging.
17. (Currently amended) ~~The method of claim 2,~~ A method of forming polypropylene, comprising:
providing a conduit having at least one catalyst valve, a first propylene stream inlet and a second propylene stream inlet, the conduit being operably connected to a polymerization vessel;
introducing a catalyst to the conduit;
passing the catalyst through the conduit to the polymerization vessel;
introducing a first propylene stream comprising propylene monomers to the conduit through a first propylene conduit having a first propylene valve to provide a mixed catalyst stream;
closing the catalyst valve and the first propylene valve;

introducing a second propylene stream to the conduit through a second propylene conduit having a second propylene valve;
passing the second propylene stream through the conduit to the polymerization vessel;
removing at least a first section of the conduit; and
replacing the first section of the conduit with a second conduit section, wherein the catalyst comprises a Ziegler-Natta catalyst.

18. (Currently amended) A method of forming polypropylene, comprising:
providing a first conduit having a catalyst inlet, a first propylene stream inlet, and a second propylene stream inlet located downstream of the first propylene stream inlet, the first conduit being operably connected to a polymerization vessel;
introducing a catalyst to the first conduit through the catalyst inlet;
passing the catalyst through the first conduit to the polymerization vessel;
introducing a first propylene stream to the first conduit to provide a mixed catalyst stream downstream of the catalyst inlet;
stopping the flow of the catalyst passing through the first conduit;
introducing a second propylene stream to the first conduit through the second propylene stream inlet;
passing the catalyst through a third conduit to the polymerization vessel; and
replacing a first section of the first conduit with a second conduit section, wherein the replacing step is conducted while polymerization occurs in the polymerization vessel.
19. (Withdrawn) A catalyst delivery system, comprising:
a conduit having a catalyst inlet, a first propylene stream inlet and a second propylene stream inlet located downstream of the first propylene stream inlet, the conduit being operably connected to a polymerization vessel and having a removable portion, the second propylene stream inlet being configured to prevent polymer from passing from the polymerization vessel into the conduit during conduit maintenance.
20. (Withdrawn) The catalyst delivery system of claim 19, further comprising a first catalyst valve and a second catalyst valve.

21. (Withdrawn) The catalyst delivery system of claim 20, wherein the removable portion is disposed between the first catalyst valve and the second catalyst valve.
22. (Withdrawn) The catalyst delivery system of claim 19, further comprising a flange disposed between the second catalyst valve and the first propylene stream inlet.
23. (Currently amended) A method of forming polypropylene, comprising;
providing a conduit having at least one catalyst valve, a first propylene stream inlet and a second propylene stream inlet, the conduit being operably connected to a polymerization vessel;
introducing a catalyst to the conduit;
passing the catalyst through the conduit to the polymerization vessel;
introducing a first propylene stream comprising propylene monomers to the conduit through a first propylene conduit having a first propylene valve to provide a mixed catalyst stream;
closing the catalyst valve and the first propylene valve;
introducing a second propylene stream to the conduit through a second propylene conduit having a second propylene valve;
passing the second propylene stream through the conduit to the polymerization vessel;
polymerizing the propylene monomers from at least one of the first and second propylene streams in the polymerization vessel;
isolating at least a first section of the conduit from the second propylene stream inlet and the polymerization vessel;
removing the first section of the conduit; and
replacing the first section of the conduit with a second conduit section, wherein the removing and replacing steps are conducted while polymerization occurs in the polymerization vessel.
24. (Previously presented) The method of claim 23, further comprising:
opening the catalyst valve and the first propylene valve; and
closing the second propylene valve.
25. (Previously presented) The method of claim 23, wherein the catalyst comprises a metallocene catalyst.

26. (Previously presented) The method of claim 25, further comprising combining an oil with the metallocene catalyst prior to introducing the metallocene catalyst to the polymerization vessel to transport the metallocene catalyst through the conduit.
27. (Previously presented) The method of claim 25, further comprising combining an oil having a kinematic viscosity of between 0.63 centistokes and 200 centistokes at 40 °C with the metallocene catalyst prior to introducing the metallocene catalyst to the polymerization vessel to transport the metallocene catalyst through the conduit.
28. (Previously presented) The method of claim 25, wherein the metallocene catalyst has an activity of 3500 gPP/(gcat*hr) or more.
29. (Previously presented) The method of claim 25, wherein the metallocene catalyst is a supported catalyst.
30. (Previously presented) The method of claim 25, wherein the metallocene catalyst comprises active metallocene in an amount of 1.5 wt% or less and metal alkyl scavenger in an amount of 12 wt % or less.
31. (Previously presented) The method of claim 23, wherein the at least one catalyst valve includes a first catalyst valve and a second catalyst valve, the first catalyst valve disposed upstream of the first propylene stream inlet.
32. (Previously presented) The method of claim 23, wherein the first propylene stream has a velocity sufficient to prevent plugging of the conduit during polymerization processes.
33. (Previously presented) The method of claim 23, wherein the at least one catalyst valve includes a first catalyst valve and a second catalyst valve, the first catalyst valve disposed upstream of the first propylene stream inlet and the second catalyst valve disposed between the first propylene stream inlet and the second propylene stream inlet.

34. (Previously presented) The method of claim 23, wherein the at least one catalyst valve includes a first catalyst valve and a second catalyst valve, the first catalyst valve disposed upstream of the first propylene stream inlet and the second catalyst valve disposed between the first propylene stream inlet and the second propylene stream inlet, and wherein the first portion is the portion between the first catalyst valve and the second catalyst valve.
35. (Previously presented) The method of claim 23, wherein the at least one catalyst valve includes a first catalyst valve and a second catalyst valve, the first catalyst valve disposed upstream of the first propylene stream inlet and the second catalyst valve disposed between the first propylene stream inlet and the second propylene stream inlet, the second catalyst valve being a tight sealing high-pressure valve.
36. (Previously presented) The method of claim 23, further comprising monitoring the conduit to identify plugging.
37. (Previously presented) The method of claim 23, further comprising monitoring the conduit to identify plugging and wherein the removing at least a section of the conduit occurs upon at least partial plugging.
38. (Currently amended) The method of claim 23. A method of forming polypropylene, comprising: providing a conduit having at least one catalyst valve, a first propylene stream inlet and a second propylene stream inlet, the conduit being operably connected to a polymerization vessel; introducing a catalyst to the conduit; passing the catalyst through the conduit to the polymerization vessel; introducing a first propylene stream comprising propylene monomers to the conduit through a first propylene conduit having a first propylene valve to provide a mixed catalyst stream; closing the catalyst valve and the first propylene valve; introducing a second propylene stream to the conduit through a second propylene conduit having a second propylene valve; passing the second propylene stream through the conduit to the polymerization vessel; polymerizing the propylene monomers from at least one of the first and second propylene streams in the polymerization vessel;

isolating at least a first section of the conduit from the second propylene stream inlet and the polymerization vessel;
removing the first section of the conduit; and
replacing the first section of the conduit with a second conduit section, wherein the catalyst comprises a Ziegler-Natta catalyst.